miles, in order to induce ſubſcribers to relinquiſh it for a rail-way; and my reaſons are, that when a rail-way is laid down, it excludes, in a great meaſure, the return trade, and ſhuts out the proſpect of extenſion; the county, beyond its extremity, has no more hope of aſſiſtance, than before its conſtruction; nor will any company unite with it; for if it is added to, the difficulties increaſe, as paſſing places are inadequate to an important trade; conſequently, it would be neceſſary to form them double, increaſing the expence and repairs; without the power of raiſing ſuccours to the high and interior country.

Yet the ſmall canal is ſufficiently wide to paſs at every part, and transfers a trade with equal eaſe; meandering the hills, it holds out aſſiſtance to the ſun-burnt fields, and ſeems to invite connection: In a country, through which a rail-way or canal is conſtructed, there is ſome hope of progreſſive improvement and future extenſion; which ultimately brings this enquiry to two queſtions: Whether do canals, or rail-ways, preſent the beſt proſpect of extenſion? And, Which will moſt facilitate conveyance by a union of branches?

It is therefore prudent to conſider well the various circumſtances, before a rail-way, of even one mile in length, is laid down.

Rail-ways of one mile, or thereabouts, will no doubt be frequently neceſſary, where it may be difficult to find water at the extremity; or when the trade from the works is not ſufficient to pay the expence of machinery, and its extent being but one mile, can be of little importance to the country.

But

But to bring theſe ſhort ſpaces into the general ſyſtem as much as poſſible, ſee D, in the Plate of Parts: which repreſents the apparatus for returning the empty boats to the collieries, or other works, in caſes where a regular deſcent can be obtained. Suppoſe, for inſtance, ſuch works diſtant ſix hundred, or perhaps, more yards, a ſingle rail-way may be conſtructed; on the ſummit of which the apparatus D is formed; and a carriage being conſtructed to receive the boat, the leading rope laps round the vertical wheel F; which wheel works by a multiplied movement in the wheel of the ſhaft G, to which a weight is ſuſpended; on a loaded boat deſcending the rail-road, its power will wind up the weight; which weight is kept up by a ſtopper on the wheel, and is a power in reſerve to draw up an empty boat; hence, when a loaded boat deſcends, it winds up the weight, and on entering the canal, the ſhaft of F and G are caſt out of gear, which ſuffers the carriage to deſcend ſufficiently to allow the boat to float: an empty boat is then placed in this carriage; and the ſtopper being caſt off the wheel on the G ſhaft, the deſcending weight will raiſe the empty boat; the movement being regulated by a break, on the ſhaft of F there are two pinions of different diameters, which are, that the wheel F performs more revolutions in a boat aſcending than deſcending. When the boat deſcends, raiſing the weight, ſhe loſes her power on entering the canal; conſequently, the pinions muſt be caſt out of gear in order to give more length of rope for the carriage to deſcend, and allow the boat to float; therefore, the portion of rope thus let off, muſt be wound up by the power of the weight, on returning the empty boat; which is done by caſting the ſmall diameter into gear. In the return movement, this mode of working will be found a very conſiderable ſaving to the proprietor, in conſequence of a ſingle plane and rope anſwering the purpoſe; and, in order that the plane may

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